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SOME NEW WESTERN BIBIONIDAE (DIPTERA)

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While attempting to determine a collection of *Bibio* several years ago, I found so many species that would not run through McAtee's keys, the only ones available, and which would not conform to any existing descriptions, that I came to the conclusion that many undescribed species occur in the Rocky Mountain region. That this should be so is not surprising, in view of the great development of this genus in past geological ages, and in view of the comparative isolation of some of the mountain regions of Colorado that are so favorable to the development of these insects. Further study, and the examination of additional material, has confirmed these conclusions.

In the present paper, nine species are described from Colorado, Kansas, and Utah. Because of the incompleteness of this work, keys are not presented herein, as was originally intended. Holotypes and allotypes have been deposited in The American Museum of Natural History; paratypes of all species may be found in the collection of the Colorado State College. For the loan of specimens, I am indebted to the University of Kansas, the Kansas State College, Utah State Agricultural College, and the University of Colorado; also to Mr. Curtis W. Sabrosky.

A character, used in the present descriptions, which has apparently been overlooked by previous workers, is the comparative length of the radio-medial cross-vein and that part of the radius-sector basad of that cross-vein. Other venational characters appear to be too uncertain, although the comparative strength of the anterior and posterior veins seems to be of value.

Bibio alexanderi, new species

Related to *B. fraternus* Loew, but the spurs on the anterior tibiae are unequal and the coloration of the wings in the two sexes is the same; the female runs to *rufithorax* in McAtee's key, but differs in having yellow legs; the male runs to *xanthopus*.

FEMALE.—Head, including the appendages, black; head yellow-pilose; eyes with short, sparse, yellow pile; palpi and antennae black-pilose. Thorax reddish yellow; the pleura with a considerable but variable amount of black; pronotum mostly

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black; scutellum, metanotum, and abdomen black; body pale-pilose. Legs yellow, mostly with soft yellow pile; the tibiae sometimes slightly darkened apically; the tarsal segments blackened apically; tibiae and tarsi with black stubby pile. Inner spurs of anterior tibiae not quite one-half as long as the outer ones. Posterior femora clavate, their tibiae cylindrical; posterior basitarsi short, about one and one-half times as long as the second tarsal segment. Wings dusky, the clouding somewhat deeper along the costal margin; veins brown; stigma distinct, brown. Cross-vein r-m about equal in length to the basal part of the radius-sector. The veins of the posterior part of the wing almost as heavy as those near the costal margin; cross-vein m-cu faint. Length, 6 mm.

MALE.—Thorax, coxae, and trochanters entirely black; pile of eyes moderately long, mostly pale; considerable bushy black pile on the lower part of the occiput; pile of the body longer and bushier than in the female; halteres black. Otherwise as in the female.

TYPES.—Holotype, female, Boulder Creek bottoms near Valmont, Colo., April 24, 1934 (E. Gordon Alexander). Allotopotype, same data. Paratopotypes, 3 females, 1 male, same data.

Bibio painteri, new species

Related to *alexanderi;* it differs as follows. The dorsum of the thorax, in the female, is extensively marked with black; the extent of this black is variable, and may cover the larger part of the dorsum. The pile of the tibiae is pale in both sexes and similar to that of the femora. In the male, the posterior tibiae, as well as the femora, are clavate; the eyes are black-haired, and there is usually a considerable amount of pale pile on the lower part of the occiput.

TYPES.—Holotype, female, allotype, male (on the same pin), Manhattan, Kansas, April 19, 1932 (R. H. Painter). Paratypes: 13 pairs, same data, in copulation; 1 male, 1 female, same data; 10 males, 4 females, Manhattan, Kansas, April 14 to 27 (C. W. Sabrosky).

Bibio atripilosus, new species

Related to *xanthopus*, to which it runs in McAtee's key; but it is quite a different species.

MALE.—Head, thorax, and abdomen wholly black; head wholly black-pilose; pile of eyes dense, moderately long, black; dorsum of thorax conspicuously yellow-pilose, with a little gray pile laterally; pleura whitish- to gray-pilose. Abdomen with conspicuous tufts of black hair on the first segment, laterally; the next segments black- to gray-pilose, this pile gradually becoming pale at the apex of the abdomen. Inner spur of the anterior tibiae one-third the length of the outer one. Hind femora and tibiae clavate, rather elongate, the basitarsi not enlarged, about one and one-half times as large as the second tarsal segment. Coxae and trochanters black; femora black, yellow at the apex, the black gradually merging into yellow; hind femora usually pale on about the apical third; tibiae yellow, the posterior ones blackish above; anterior tibiae rusty yellow; tarsi yellow, the segments after the first, darkened, at least apically. Wings grayish-hyaline; stigma and strong veins brown, the other veins yellow; the veins of the posterior part of the wing not much paler than those of the anterior part; cross-vein r-m almost as long as the basal part of vein R_5. Length, 7 mm.

TYPES.—Holotype, male, Boulder, Colo., May 5, 1934 (James). Paratopotypes: 5 males, same data; 1 male, Boulder, Colo., April 17, 1934 (James); 1 male, Boulder, Colo., May 16, 1933 (James).

Bibio monstri, new species

Related to *labradorensis* Johnson, but readily distinguished from that species by the black femora and the black pile of the thorax.

MALE.—Head, with appendages, thorax, and abdomen, black. Head wholly black-pilose; eyes with copious black pile. Thorax with moderately sparse but long black pile dorsally and a heavy tuft of the same color on each squama; pile otherwise gray. First abdominal segment with heavy, close, black pile; pile otherwise looser, gray to white, and somewhat longer. Coxae, trochanters, and femora black, black-pilose, the posterior ones partly pale-pilose; tibiae and basitarsi yellow, darkened

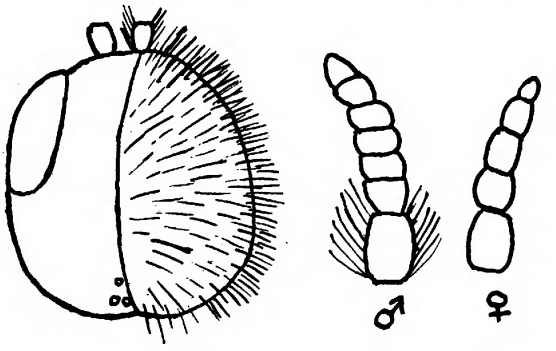

Fig. 1. *Bibio monstri,* new species. Gynandromorph. Head, dorsal view; antennae.

apically; the other tarsal segments brown to black; pile of tibiae and tarsi variably gray to yellow. Inner spurs of anterior tibiae very small. Posterior tibiae and femora elongate, clavate, the tibiae being the thicker; posterior basitarsi enlarged, as thick as the apices of the femora; the three following segments more or less globular. Wings pale yellow, almost white, hyaline; the costa brown, the other anterior veins yellow; the remaining veins barely discernible from the membrane; stigma obsolete, represented only by a pale yellow clouding along the apex of vein R_1; cross-vein r-m about one-half the length of the basal part of R_5. Length, 6 mm.

TYPES.—Holotype, male, Trail Ridge Road, Rocky Mountain National Park, Colo., 12,200 ft., Aug. 25, 1933 (M. T. James). Paratypes: male, same data; 9 males, Estes Park, Aug., 1892 (F. H. Snow).

A peculiar gynandromorph belonging to this species has the head half male and half female; otherwise, it seems to be a normal male. The bizarre appearance produced by the large, long-pilose, eye on the one side, and the small, bare one on the other, is shown by the accompanying illustration. The difference in the antennae will also be noted.

Bibio pingreensis, new species

Related to *inaequalis* Loew, but the posterior basitarsi are not so noticeably enlarged and the legs are differently colored; it is more robust than *longipes*, and the structure of the posterior tarsi is different.

MALE.—Head, with appendages, thorax, and abdomen black. Head wholly black-haired, the eyes with copious black hair. Thorax, abdomen, and legs with long yellowish pile; a little gray pile on the mesopleura; some short black pile on the tibiae and tarsi. Coxae, trochanters, femora, and anterior tibiae black; the spurs on the anterior tibiae yellow, the inner spur one-third the length of the outer one; posterior femora strongly clavate, the constricted basal part yellowish; middle tibiae brown; posterior tibiae yellowish to brown; tarsi brown, the basitarsi yellowish to brown. Posterior basitarsi slightly enlarged, but cylindrical, rather than globular, as in the related species. Wings whitish or slightly grayish hyaline; the strong veins brown; the posterior ones barely discernible from the membrane; cross-vein r-m about one-half as long as the basal section of vein R_s. Length, 7–8 mm.

TYPES.—Holotype, male, Mummy Pass, Alpine zone, Pingree Park, Colo., Aug. 18, 1932 (Leonard Sweetman). Paratopotypes, 4 males, same data.

Bibio macateei, new species

This is apparently the species which McAtee refers, with a query, to *humeralis* Walker. Walker's species is unidentifiable from the description and is from a far-distant locality; therefore, in view of the fact that I have before me a good series of specimens, including both sexes, it seems better to describe the species as new rather than to retain a very questionable determination.

FEMALE.—Head, with appendages, thorax, and abdomen black; the humeri, the complete V-shaped anterior margin of the mesonotum, and several irregular and variable splotches on the pleura, yellowish to brown. Head with short black pile on the vertex, front, and antennae; sometimes also some paler pile on the front; that of the lower occiput longer, bushy, and pale. Body pale-pilose; some short, stubby, grayish pile on the legs. Coxae and trochanters black, the anterior ones reddish outside; femora, tibiae, and tarsi bright yellow, the three apical tarsal segments darkened, the other two brownish apically; the inner spur of the anterior tibia one-third the length of the outer one. Posterior femora clavate. Wings uniformly yellow; stigma and strong veins brown; the posterior veins concolorous with the membrane and barely discernible; cross-vein r-m as long as the basal section of vein R_s. Length, 8–9 mm.

MALE.—Thorax entirely black, except for the very narrow anterior margins of the mesonotum, which are yellow, the yellow, however, merging into black medially; anterior coxae and trochanters black. Pile of entire body long and bushy; some black pile on the under side of the head and behind the ocellar triangle; that of the eyes dense, black; otherwise, except the short black pile of the tibiae and tarsi, whitish or yellowish. Posterior tibiae as well as the femora clavate; the basitarsi slightly enlarged, but cylindrical. Otherwise as in the female.

TYPES.—Holotype, female, Trail Ridge Road, Rocky Mountain National Park, 11,000 ft., Aug. 25, 1933 (M. T. and H. B. James). Allotype, same data. Paratypes: 2 females, 9 males, same data; 2 males, Brainerd Lake, Colo., Aug. 28 (T. D. A. Cockerell).

Bibio similis, new species

Related to *B. albipennis*, of which it may be a variety or subspecies, but readily distinguished by the long cross-vein r-m, which is almost as long as the basal section of vein R_s.

MALE.—Body entirely black, mostly with bushy pale yellow pile; a few long gray hairs on the abdomen and on the coxae; lower part of the occiput with bushy black pile; pile of eyes long, rather dense, and black; tibiae and tarsi with short black and pale hair intermixed, mostly erect. Posterior tibiae and tarsi clavate; their basitarsi not enlarged, about one and one-half times as long as the second tarsal segment. Claws of anterior tibiae reddish; the inner one one-third the length of the outer one; anterior basitarsi narrowly yellow at the base. Wings whitish hyaline; veins and stigma black, the posterior veins but slightly weaker than the anterior ones; cross-vein r-m about as long as the basal section of vein R_s. Length, 8 mm.

TYPES.—Holotype, male, Boulder, Colo., May 5, 1934 (M. T. James). Paratypes: male, Rifle, Colo., May 5, 1905; 2 males, Fort Duchesne, Utah, May 17, 1933 (F. K. Stoffers).

Five species of *Bibio* known to me have the radio-medial cross-vein very short, this vein being not more than one-third (usually one-fourth or less) the length of the basal section of the radius sector. The following table will serve to separate these species.

1.—Legs wholly black or dark brown.....2.
At least the tibiae yellow; posterior basitarsi but slightly longer than the second tarsal segment.....4.
2.—Posterior basitarsi twice as long as the second tarsal segment.....3.
Posterior basitarsi not more than one and one-half times as long as the second tarsal segment.....*tenuipes* Coquillett.
3.—Wings milky white.....*albipennis* Say.
Wings dusky.....*afer* McAtee.
4.—Femora black in male, yellow in female; thorax and abdomen mostly black-pilose. *curtipes*, n.sp.
Femora yellow in both sexes; abdomen at most gray-pilose....*kansensis*, n.sp.

Bibio afer McAtee

A series of specimens, Douglas Co., Kansas, May 11, 1931 (Beamer), has been referred to this species; they have the short cross-vein r-m, which McAtee does not mention in his description.

Bibio curtipes, new species

Related to *tenuipes* Coquillett, but the legs are extensively yellow and the vestiture of the body mostly black.

FEMALE.—Head, with appendages, thorax, and abdomen, wholly black; pile of head black; that of thorax black, intermixed with white; that of abdomen black on the disc, both dorsally and ventrally, a little whitish laterally. Legs yellow, short, the segments thick; the coxae slightly darkened, the apical two or three tarsal seg-

ments moderately so; pile very largely black. Halteres black. Inner claw of anterior tibiae about one-half the length of the outer one. Posterior femora clavate, the tibiae not so. Posterior basitarsi barely longer than the second tarsal segment. Wings slightly infumated; the anterior veins blackish, the posterior ones yellowish, but distinctly darker than the membrane; stigma distinct, black. Cross-vein r-m one-fourth the length of the basal part of vein R_s. Length, 6–7 mm.

MALE.—Eyes with moderately long and moderately dense black pile. Coxae, trochanters, and femora black; the tibiae and tarsi brownish yellow, the latter more darkened apically. The pile of the body may be entirely black, or there may be a little pale pile on the dorsum of the thorax and on the abdomen laterally. Otherwise as in the female.

TYPES.—Holotype, female, Boulder, Colo., May 5, 1934 (M. T. James). Allotype, same data. Paratypes: 2 males, same data; 2 males, "Colo. 4421," Walsenburg, Colo., May 16, 1928, sweeping wheat fields (S. C. McCampbell); 1 male, Bothwell, Utah, May 8, 1931, on *Norta altissima* (G. F. Knowlton).

Bibio kansensis, new species

Similar to *fraternus* Loew, but the spurs of the anterior tibiae are unequal and the venation is different; it may be distinguished from other species of *Bibio* (except the female of *curtipes*) by the short cross-vein r-m and the wholly pale legs.

FEMALE.—Black, the pile of the body mostly grayish; legs short, thick, a somewhat obscure yellow in color, the coxae and trochanters darkened, the pile of the legs grayish to black, that of the tibiae stubby; the inner spur of the anterior tibiae not more than one-fourth the length of the outer one; posterior basitarsi flattened, barely longer than the second tarsal segment. Wings dusky hyaline; veins brown, heavier near the costa; stigma brown; cross-vein r-m one-third to one-fourth the length of the basal part of the radius sector. Length, 5–6 mm.

MALE.—Similar to the female; the pile of the body tends to be longer and darker, and the legs are slightly darkened.

TYPES.—Holotype, female, Kirwin, Kansas, May 9. Allotype, same data. Paratypes: about one hundred and fifty specimens, from the collection of the Kansas State College, same data as the above, and no locality, April 13.